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PATENT COOPERATION TREATY

PCT/FR2003/003887



PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference BCT030154	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/FR2003/003887	International filing date (day/month/year) 23 décembre 2003 (23.12.2003)	Priority date (day/month/year) 26 décembre 2002 (26.12.2002)
International Patent Classification (IPC) or national classification and IPC H01L 21/208, 31/032, 31/18		
Applicant ELECTRICITE DE FRANCE (SOCIETE ANONYME)		

- This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 5 sheets, including this cover sheet.  
☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of \_\_\_\_\_ sheets.

- This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 18 mai 2004 (18.05.2004)	Date of completion of this report 24 May 2005 (24.05.2005)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/FR2003/003887

## I. Basis of the report

## 1. With regard to the elements of the international application:\*

- ☐ the international application as originally filed
- ☒ the description:  
pages 1-16, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☒ the claims:  
pages 1-10, as originally filed  
pages \_\_\_\_\_, as amended (together with any statement under Article 19  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☒ the drawings:  
pages 1/2-2/2, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the sequence listing part of the description:  
pages \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

## 2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

## 3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/fig \_\_\_\_\_

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/FR 03/03887

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. Statement**

Novelty (N)	Claims	1-10	YES
	Claims		NO
Inventive step (IS)	Claims	2, 10	YES
	Claims	1, 3-9	NO
Industrial applicability (IA)	Claims	1-10	YES
	Claims		NO

**2. Citations and explanations**

1. Claim 1 is not considered to be inventive over the following document, which is the prior art closest to the invention:

D1: "Preparation and properties of electrodeposited InSe and CuxSe thin films", P. Obreja et al., SEMICONDUCTOR CONFERENCE, 6/10/1998, XP010313827.

D1 (see D1, the introduction and page 236, column 1, lines 8-14) mentions the electrodeposition of CuInSe<sub>2</sub> and describes the electrodeposition of CuSe and InSe films using a surfactant in the bath. Based on the teaching of D1, a person skilled in the art seeking to deposit a CuInSe film would modify the composition of the electrodeposition bath so that it contains the elements Cu, In and Se as well as a surfactant. This is the subject matter of claim 1.

Claims 3-9 are dependent on claim 1 and disclose specific compositions for the surfactant. Said compositions are known to a person skilled in the art and add no inventive features to claim 1 (PCT Article 33(3)).

Claim 2 is novel and inventive because the electrodeposition of an I-III-VI compound, in which element III comprises gallium or aluminium, using an electrodeposition bath containing a surfactant is not known and it does not appear possible to derive this subject matter in an obvious manner from the teaching of D1 (PCT Article 33(2) and 33(3)).

Claim 10, when considered to be dependent on claim 2, is also novel and inventive.

2.1 Furthermore, claims 1-10 do not mention the presence of elements I and VI in the electrolysis bath, yet this is an essential feature for the definition of the invention (the electrodeposition of an I-III-VI film is impossible if the electrolysis bath does not contain elements I and VI). This is contrary to the requirements of PCT Article 6.

2.2 Contrary to the requirements of PCT Article 6, claims 1-10 are not supported by the description because the scope of said claims is broader than that justified by the description and the drawings. The reasons for this are as follows:

The present application describes an electrodeposition method for forming a film consisting of an I-III-VI compound (I = Cu, II = (Ga or Al) and In, III = Se), wherein a surfactant is added to the bath in order to facilitate the incorporation of the gallium (or aluminium) into said film.

Claim 1 does not specify what elements I, III and VI

are contained in the electrolysis bath and, as a result, the scope of said claim is broader than that disclosed in the description.

2.3 Since the aim of the invention is to ensure that a high percentage of the elements Ga and/or Al is properly incorporated into the I-III-VI film, a range should be given for the Ga/Al content in said bath in relation to the other compounds. In order for claims 1-10 to fulfil the requirements of PCT Article 6, this feature is considered to be essential for the definition of the invention (if the Ga/Al content is sufficiently low, the addition of a surfactant to the bath is not necessary).

2.4 Similarly, the surfactant concentration in the bath appears to be an essential feature for the definition of the invention. Since claims 1-9 do not specify this concentration, they do not fulfil the requirements of PCT Article 6. A surfactant concentration that is too low, for example, would not have the desired effect.